



## Smallholder Farmers' Perceptions on Drivers of Land Degradation and its Impact on their Livelihoods in the Kuje Area Council of Abuja, Nigeria

\*<sup>1</sup>ABENU, A; <sup>2</sup>YUSUFU, FA; <sup>1</sup>SAHABO, MM

<sup>1</sup>*Air Force Institute of Technology, Kaduna State, Nigeria*

<sup>2</sup>*Department of Geography, College of Education, Akwanga, Nasarawa State, Nigeria*

\*Corresponding Author Email: [abenuabigail@yahoo.com](mailto:abenuabigail@yahoo.com)

Co-Authors Email: [tellfunmi@yahoo.com](mailto:tellfunmi@yahoo.com); [M.m.sahabo@edu.salford.ac.uk](mailto:M.m.sahabo@edu.salford.ac.uk)

**ABSTRACT:** Land degradation is a global problem that has adversely affected agriculture. The Guinea Savannah ecological zone is one of the regions experiencing large-scale land degradation in Nigeria. Because of the important role agriculture plays in the economy of Nigeria, this study therefore examines smallholder farmers' perception of drivers of land degradation and its impact on their livelihoods in the Kuje Area Council of the Federal Capital Territory, Abuja; an area within the Guinea savannah ecological zone. A survey of smallholder farmers was conducted and the instrument used for data collection was a questionnaire. Most of the respondents perceived that overgrazing (96.7%), soil erosion (92.7%), bush burning (82.2%), continuous soil tillage (80.2%), sand mining (72.3%) and deforestation (63.2%) are responsible for land degradation in the area. The livelihoods of farmers are negatively impacted because land degradation has led to a reduction in land productivity; dependence on chemical fertilizers, which increases the cost of crop production; and loss of farm labour. To mitigate land degradation; controlled grazing, afforestation and controlled sand mining should be encouraged; in addition to the provision of cheap alternative cooking energy by the government to help reduce the rate of deforestation.

DOI: <https://dx.doi.org/10.4314/jasem.v27i6.21>

**Open Access Policy:** All articles published by **JASEM** are open access articles under **PKP** powered by **AJOL**. The articles are made immediately available worldwide after publication. No special permission is required to reuse all or part of the article published by **JASEM**, including plates, figures and tables.

**Copyright Policy:** © 2023 by the Authors. This article is an open access article distributed under the terms and conditions of the **Creative Commons Attribution 4.0 International (CC-BY- 4.0)** license. Any part of the article may be reused without permission provided that the original article is clearly cited.

**Cite this paper as:** ABENU, A; YUSUFU, F. A; SAHABO, M. M. (2023). Smallholder Farmers' Perceptions on Drivers of Land Degradation and its Impact on their Livelihoods in the Kuje Area Council of Abuja, Nigeria. *J. Appl. Sci. Environ. Manage.* 27 (6) 1203-1206

**Dates:** Received: 02 May 2023; Revised: 11 June 2023; Accepted: 21 June 2023; Published: 30 June 2023

**Keywords:** Guinea Savannah ecological zone; land degradation; agriculture, crop production

Land degradation was a significant global issue during the 20<sup>th</sup> century and remains a major challenge in the 21<sup>st</sup> century as it affects the environment, agronomic productivity, food security and quality of life (Teshahunegn, 2019; Ziadat *et al.*, 2022). In many parts of Sub-Saharan Africa, land degradation has affected about 20% -50% of arable land. Around the globe, an area of about 5–8 million hectares of arable land goes out of cultivation due to degradation annually (Kirui and Mirzabaev, 2014). Land degradation is the temporary or permanent decline in the productive capacity of the land or its potential for environmental management; and is caused by various human and natural factors (Warren, 2002; cited in Abdeta and Geleto, 2018). Land degradation has increased the number of people living in poverty,

particularly in farming communities, as crop yields are reduced and some farmers lose their source of livelihood (FAO, 2015). Agriculture is largely land dependent. In Nigeria, it is one of the major sectors of the economy. As of the first quarter of 2020, it contributed about 22% to the Gross National Product (GDP). In addition, a large proportion of people are employed in the sector, particularly those living in the rural areas of Nigeria, as more arable lands are available compared to the urban areas. This makes agriculture a major stay of the economy; and it has been strategic in stimulating the development of the rural economy. Agriculture in the country is segmented into crop production, fishing, livestock and forestry; with crop production being the largest as it accounts for more than three-quarters of the sector's

\*Corresponding Author Email: [abenuabigail@yahoo.com](mailto:abenuabigail@yahoo.com)

total output. About 80% of the people involved in crop production are smallholder farmers, cultivating less than 10 hectares of land each (Mgbenka and Mbah, 2016; Oyaniran, 2020). Large-scale land degradation is one of the major problems facing agricultural development in Nigeria, particularly in Guinea Savannah; which is a major food-producing region in the country (Macaulay, 2014; Adenle and Ifejika Speranza, 2021). Despite the widespread recognition of the existence of the problem of land degradation in Nigeria, there is a dearth of literature on farmers' perceptions of the drivers of land degradation in the Guinea Savannah ecological zone, particularly in the Federal Capital Territory (FCT), Abuja; which has been identified as one of the hot-spot of large-scale degradation in Nigeria (Adenle and Ifejika Speranza, 2021). Hence, this study is undertaken to examine farmers' perceptions of drivers of land degradation and its impact on their livelihoods in the Kuje Area Council of the Federal Capital Territory, Abuja.

## MATERIALS AND METHOD

*Description of Study Area:* The study area, Kuje Area Council, is one of the six Area Councils in Abuja; and is located within the Guinea Savannah ecological zone. It is largely made up of rural settlements. It occupies about 22.5% of the 8,000 km<sup>2</sup> that constitutes the land mass of the FCT.

The concentration of the administrative functions of the FCT in other Area councils of the FCT, such as the Abuja Municipal pushed some of the indigenous ethnic groups into Area Councils. Hence, Kuja Area Council is one of the Area councils of the FCT where many of the indigenous ethnic groups are found. The major ethnic groups dominating the area are Bassa, the Gade, Koro, Ganagana and Gwandara. These groups engage mainly in agricultural activities, with a good number of them in subsistence farming (Balogun, 2001; Adenle and Ifejika Speranza, 2021).

*Reconnaissance and Questionnaire Distribution:* A reconnaissance survey was conducted within the study area to various wards that make up the Kuje Area Council. Seven rural communities (Chibiri, Gaube, Kabi, Yanche, Kuje, Pegi and Rubochi) were selected for inclusion in the survey (see Fig. 1) and the questionnaire was distributed to 196 smallholder crop farmers who have been farming for more than 5 years.

The choice of this category of farmers is because they have sufficient work experience and knowledge to be able to answer the questionnaire items on causes and indicators of land degradation. One hundred and fifty-two copies of the questionnaire were retrieved.

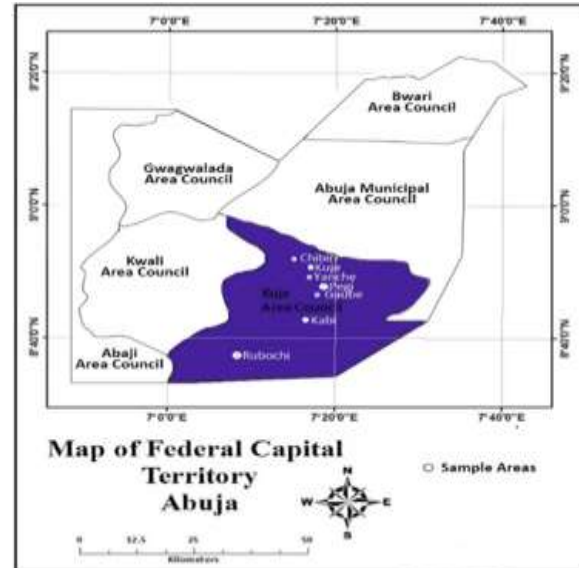


Fig. 1: Administrative Map of the FCT Abuja, showing the sample points in Kuje Area Council

*Data Analysis:* The data collected was analysed quantitatively with Statistical Package for the Social Sciences (SPSS) V23.0 and Microsoft Excel software. Percentages were used to summarize the data and visual presentation with charts was employed.

## RESULTS AND DISCUSSIONS

*Drivers of Land Degradation in the Study Area:* Several anthropogenic and natural factors have been identified as drivers of land degradation in Kuje Area Council (see Fig. 2). Foremost among the factors is overgrazing, where 96.7% of the respondents opined that it is the main factor responsible for the land degradation being experienced in the area. Many domestic animals are reared on arable land despite bans on open grazing in the Federal Capital Territory, Abuja; as the enforcement of the ban is mainly observed in urban areas of the territory. Animal herders in rural areas like the study area, which is largely rural, are known to openly move large herds of animals, particularly cows, sheep and goats, to graze on arable lands while they are cultivated during planting season and the post-planting seasons. The overgrazing of animals depletes vegetal covering on the land and opens up bare spaces, thus leaving the land open to elements like wind and rain to remove the soil layers. During the dry season (November to mid-April), when the movement of animals is more frequent, crop residue on farmlands is also consumed by the animals which also makes soil surfaces to be bare at a period when wind is more active as an agent of erosion. In addition, the constant stamping of animal hooves on soil increases soil compaction, which the respondents in the study affirm negatively

affects the growth of crops. A large proportion of the respondents, 92.7%, opined that soil erosion is one of the drivers of land degradation. Soil layers are carried by water (rain), wind and ice. In the study area, wind and rain are the elements that are known to erode soil, particularly when the soil is left bare, it is left unprotected against the elements. Dry seasons are periods when the wind on bare surfaces or uncultivated arable land is most active, resulting in sheet erosion. The wet season in the study area which commences in mid-April and terminates in October, causes rainwater to erode soil surfaces; sometimes not only is the topsoil washed away, but subsoils are also affected in severe cases. While wind and rain are natural elements that carry soils away, and are very active on bare surfaces; human activities are increasing the bare surfaces through activities such as deforestation, overgrazing and sand mining. Pre-planning activities, where land is prepared for cultivation are labour-intensive for subsistence farmers who practice little or no mechanisation. Most farmers, who lack capital to employ people to clear the farmland with hoes and cutlasses are left to prepare their land by setting fire to the vegetation, to reduce the labour required to clear the land for planting. Bush burning is considered by a large proportion of the respondents, 82.2%, as being one of the drivers of land degradation. The burning of vegetation before planting negatively affects the moisture-holding capacity of soils, affects living organisms in the topsoil that promotes the cultivation and when the wind blows away the ash left after burning; the soil surface is left bare sometimes for weeks before the commencement of rain; and in this period wind and water accelerate the removal of the soil layers. Continuous tillage of soil was seen by 80.2% of the respondents as a factor that contributes to land degradation. There is pressure on the arable land in the study area. As such, cultivation is continuous without a fallow period or appropriate crop rotation practice that would have promoted the natural rejuvenation of soil nutrients. Extraction of soil nutrients by plants year after year has depleted soil nutrients over time and increased the dependence on chemical fertilizers, which in itself could change the composition of the soil; thus also degrading the soil. Sand mining was seen by about three-quarters, 72.3%, of the respondents as a factor that drives land degradation. Sand mining in the study area is common around river banks and its surrounding; these places which are flood plains that have promoted crop production are degraded as both topsoil and subsoils are excavated. The study area, although it is largely rural, is situated close to Abuja Municipal Area Council, the centre of administrative work in the Federal Capital Territory; which is experiencing a great expansion of its built-up area. As

such, sand which is a vital building material is being extracted from places like Kuje Area Council to meet the high demand. The uncontrolled sand mining has made some farmers abandon impaired arable lands. In the study area, fuel wood is a common source of fuel for cooking; as is typical in many rural settlements in Nigeria. This has led to deforestation and general depletion of vegetation cover in the study area. More than half of the respondents, 63.2%, consider deforestation as being one of the factors that bring about land degradation in the area. Depleted vegetal cover through deforestation reduces soil organic matter and exposes greater soil surface to wind and rain, which erodes it.

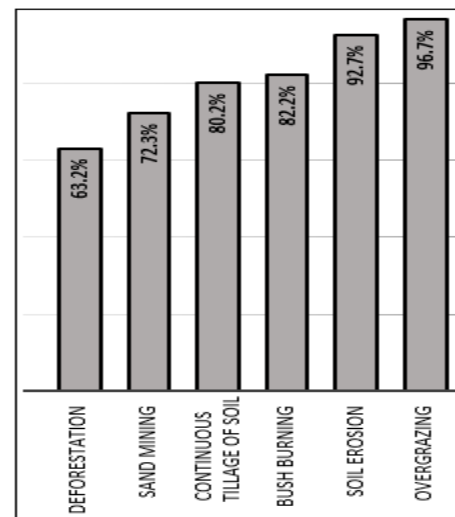


Fig. 2: Drivers of Land Degradation in Kuje Area Council of Abuja

#### *Impact of Land Degradation on Farmers' Livelihoods:*

The productivity of land in crop production is dependent on the quality of the soil. Slightly more than three-quarters, 79.6%, of the respondents affirm that there is a clear decline in the productivity of their farms as a result of the degradation of the land (see Fig. 3). The decline in vegetal cover of land through deforestation and bush burning depletes soil nutrients and directly impacts crop yields; as does soil erosion. One of the consequences of overgrazing and continuous tillage is their effects on soil compaction as the bulk density increases. The increase in soil bulk density retards plant growth, since development is inhibited, this contributes to reduced crop yields for farmers in the study area. Continuous tillage which characterizes farming in the area is also one factor that contributes to the depletion of soil nutrients which adversely affects the quantity of crops produced. The quantity of litter supplied improves organic matter in soils, this is lessened as bush burning and deforestation are carried out in the area. The reduction in

productivity of soil consequently leads to greater use of chemical fertilizers by the farmers, as shown by the proportion of the respondents (73.7%) who attest that they depend on chemical fertilizer to be able to have an appreciable amount of harvest (see Fig. 3). Intensive continuous tillage and use of fertilizers and biocides further disrupt soil animal communities. In addition, the use of chemical fertilizer increases the cost of cultivation; hence many farmers' income could reduce; thus making them impoverished and continually low on the socio-economic hierarchy in the country. Typically, smallholder farms are labour-intensive, with very little or no mechanization; the degradation of land which affects the productivity of land was seen as affecting the available farm labour. About one-quarter of the respondents, 24.2%, attest that land degradation has led to the loss of farm labour (see Fig. 3). Most labour used on the farms is from family members, however, the reduction in productivity and purchase of inorganic fertilizers affects family income and some members of the family (especially the youths) move to nearby urban areas to seek other forms of livelihoods.

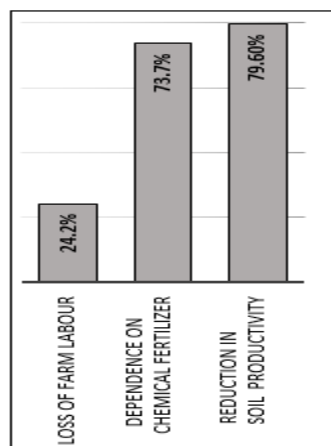


Fig. 3: Impacts of Land Degradation on Farmers' Livelihoods

**Conclusion:** This study concluded that several factors, most of which are interrelated, are responsible for land degradation in the study area. Overgrazing, soil erosion, bush burning and continuous soil tillage are foremost among the drivers of land degradation in the area. The livelihoods of farmers have been affected because land degradation has led to reduced productivity of land, great dependence on the use of chemical fertilizer and loss of farm labour. Government agencies and farmers need to promote local initiatives that would mitigate land degradation, in addition to controlled grazing, afforestation and controlled sand mining. Government initiatives that help rural dwellers to access cheap alternative cooking energy would also help to reduce the rate of deforestation.

## REFERENCES

- Abdeta, GC; Geleto, GM (2018). Farmers' Perception on Land Degradation and Adoption of Soil-Water Conservation Measures in Ethiopian Highlands: Review Article. *J. Res. Dev. Manage.* 40 (1):36-54.
- Adenle, AA; Ifejika Speranza, C (2021). Social-Ecological Archetypes of Land Degradation in the Nigerian Guinea Savannah: Insights for Sustainable Land Management. *Remote Sens.* 13(32) <https://dx.doi.org/10.3390/rs13010032>.
- Balogun, O (2001). The Federal Capital Territory of Nigeria: A Geography of its Development. Ibadan University Press: Nigeria.
- Food and Agriculture Organization (2015). Global Guidelines for the Restoration of Degraded Forests and Landscapes in Drylands: Building Resilience and Benefiting Livelihoods, by Berrahmouni, N., Regato, P. & Parfondry, M. Forestry Paper No. 175. Rome, Food and Agriculture Organization of the United Nations.
- Kirui, OK; Mirzabaev, A (2014). Economics of Land Degradation in Eastern Africa. ZEF Working Paper Series, No. 128, University of Bonn, Center for Development Research (ZEF), Bonn.
- Macaulay, BM (2014). Land Degradation in Northern Nigeria: The Impacts and Implications of Human-related and Climatic Factors. *Afr. J. of Env. Sci. Tech.* 8 (5): 267-273.
- Mgbenka, RN; Mbah, EN (2016). A Review Of Smallholder Farming in Nigeria: Need for Transformation. *Intl J. Agric. Ext. Rural Dev. Studies*, 3(2):43-54.
- Oyaniran, T (2020). Current State of Nigeria Agriculture and Agribusiness Sector. African Continental Free Trade Area Workshop, Nigeria.
- Tesfahunegn, GB (2019). Farmers' perception on land degradation in northern Ethiopia: Implications for developing sustainable land management. *The Soc. Sci. J.* 56(2): 268-287.
- Ziadat, FM; Zdruli, P; Christiansen, S; Caon, L; Abdel Monem, M; Fetsi, T (2022). An Overview of Land Degradation and Sustainable Land Management in the Near East and North Africa. *Sustain. Agric. Res.* 11(1): 11-24.